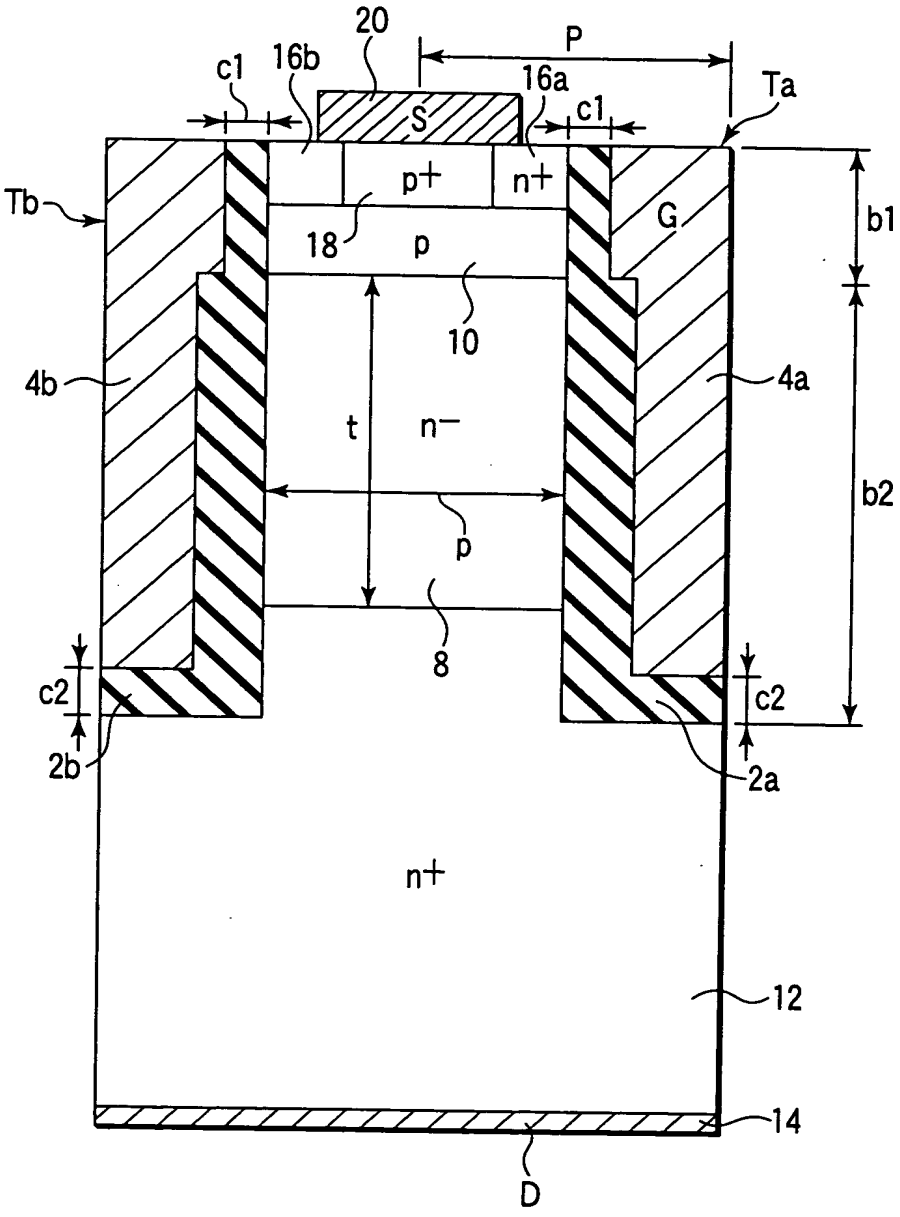

20
P
c1
16b
16a
c1
Ta
S
Tb
p+
n+
G
b1
18
p
10
4b
4a
t
n−
b2
p
8
c2
c2
2b
2a
n+
12
14
D

FIG. 1

FIG. 2

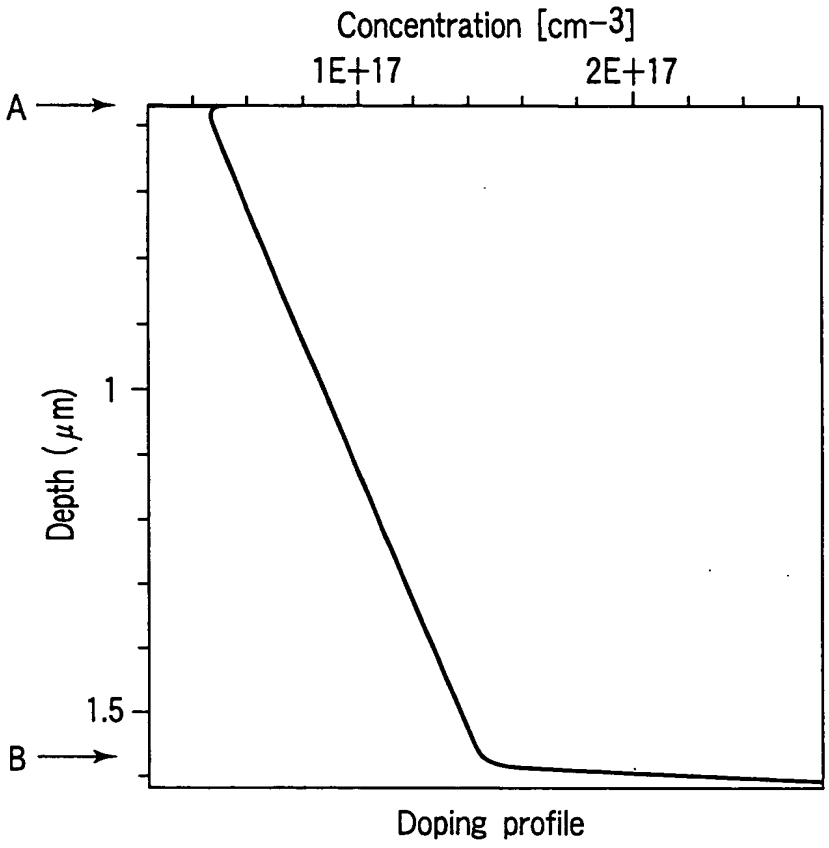
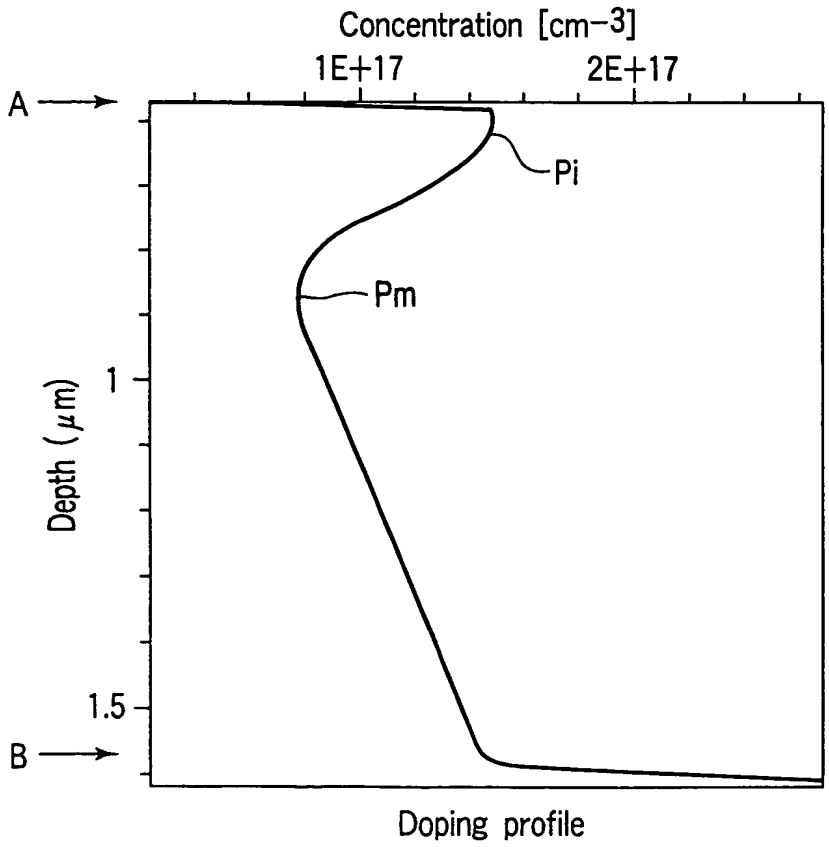

Concentration [cm−3]
1E+17
2E+17
A
1
1.5
B
Depth (μm)
Doping profile

FIG. 4


Concentration [cm−3]
1E+17
2E+17
A
Pi
Pm
1
1.5
B
Depth (μm)
Doping profile

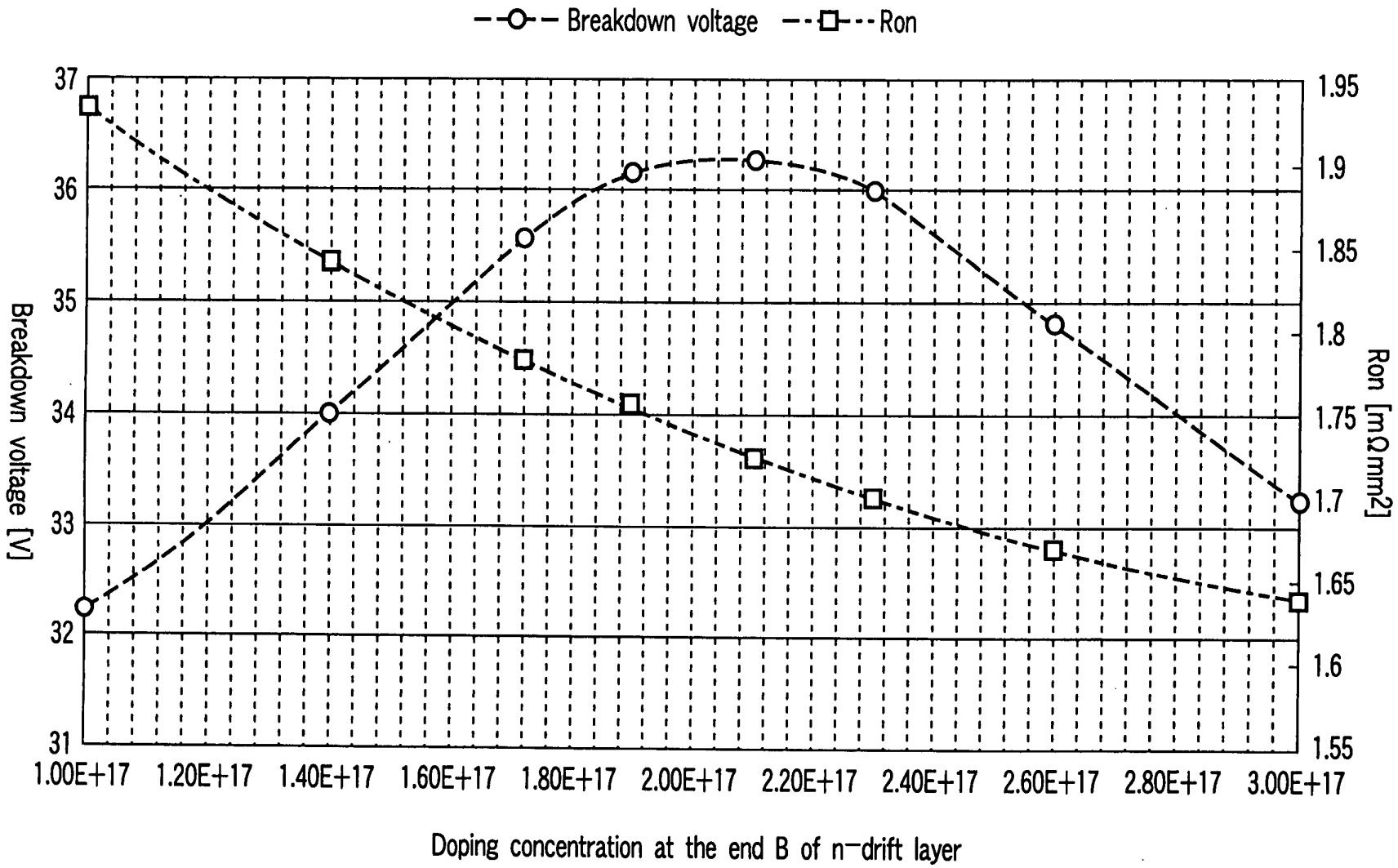

Breakdown voltage
Ron
Breakdown voltage [V]
Ron [mΩmm2]
37
36
35
34
33
32
31
1.95
1.9
1.85
1.8
1.75
1.7
1.65
1.6
1.55
1.00E+17
1.20E+17
1.40E+17
1.60E+17
1.80E+17
2.00E+17
2.20E+17
2.40E+17
2.60E+17
2.80E+17
3.00E+17
Doping concentration at the end B of n−drift layer

FIG. 3

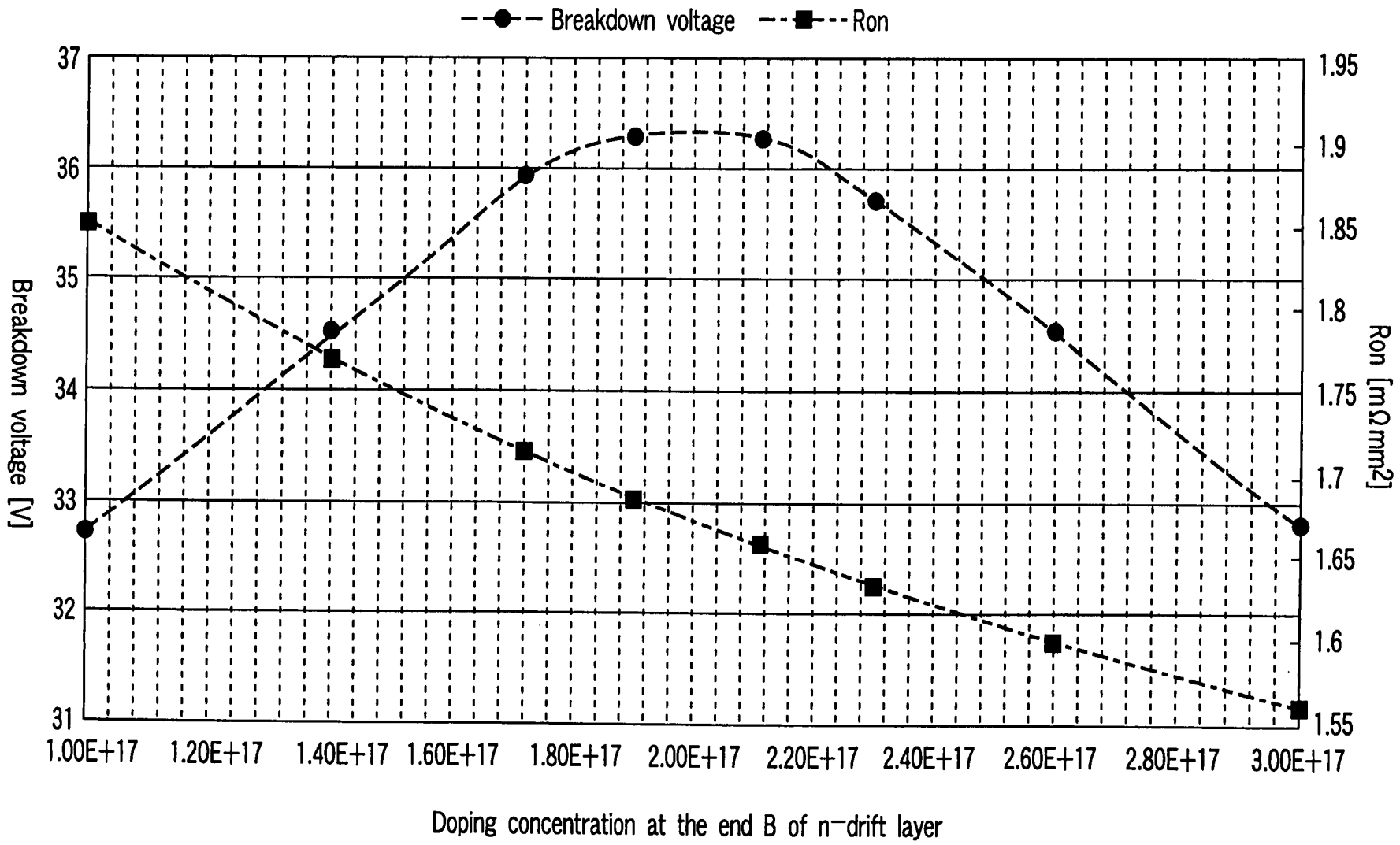

Breakdown voltage
Ron
37
36
35
34
33
32
31
1.95
1.9
1.85
1.8
1.75
1.7
1.65
1.6
1.55
Breakdown voltage [V]
Ron [mΩmm2]
1.00E+17
1.20E+17
1.40E+17
1.60E+17
1.80E+17
2.00E+17
2.20E+17
2.40E+17
2.60E+17
2.80E+17
3.00E+17
Doping concentration at the end B of n−drift layer

FIG. 5

FIG. 6

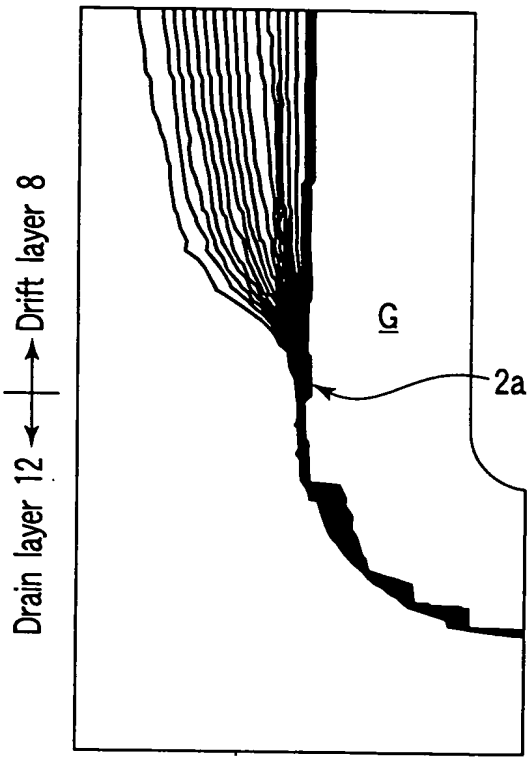


FIG. 7

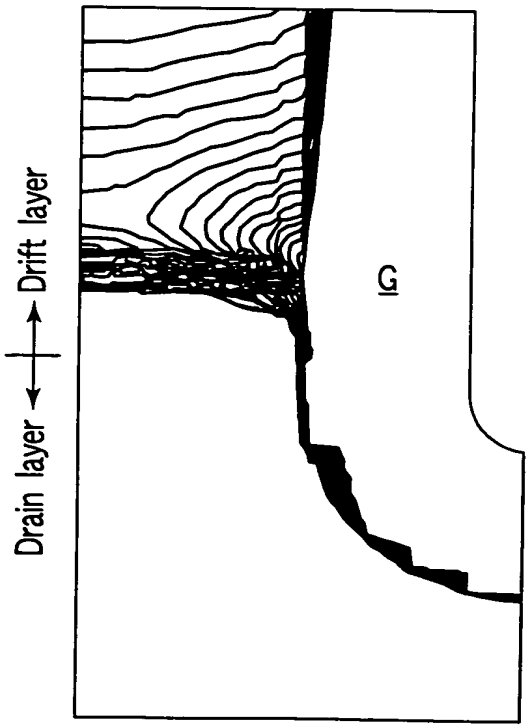


FIG. 8A

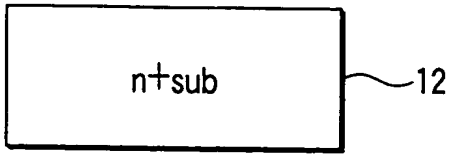


FIG. 8B

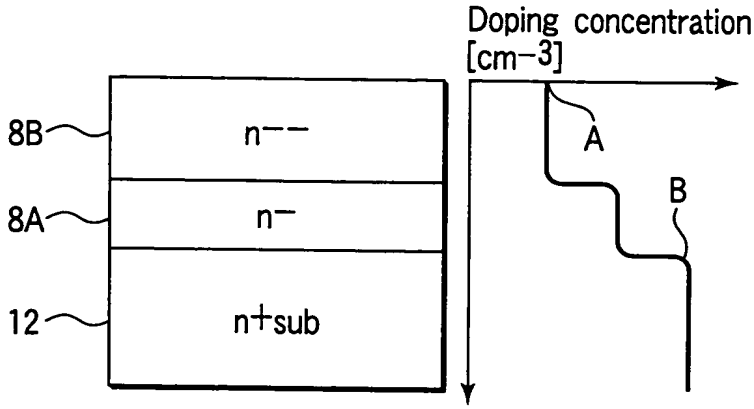
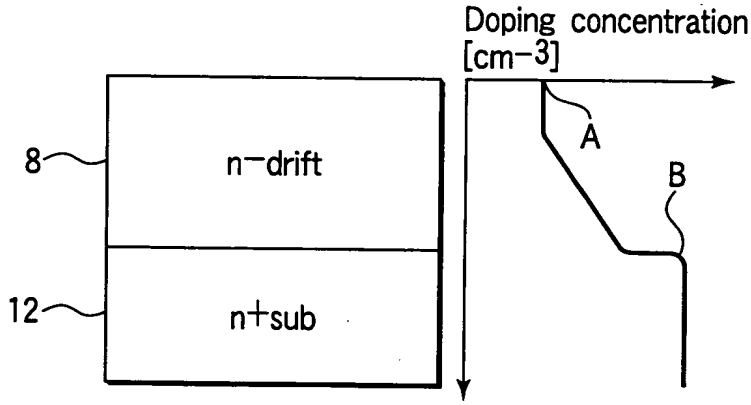


FIG. 8C



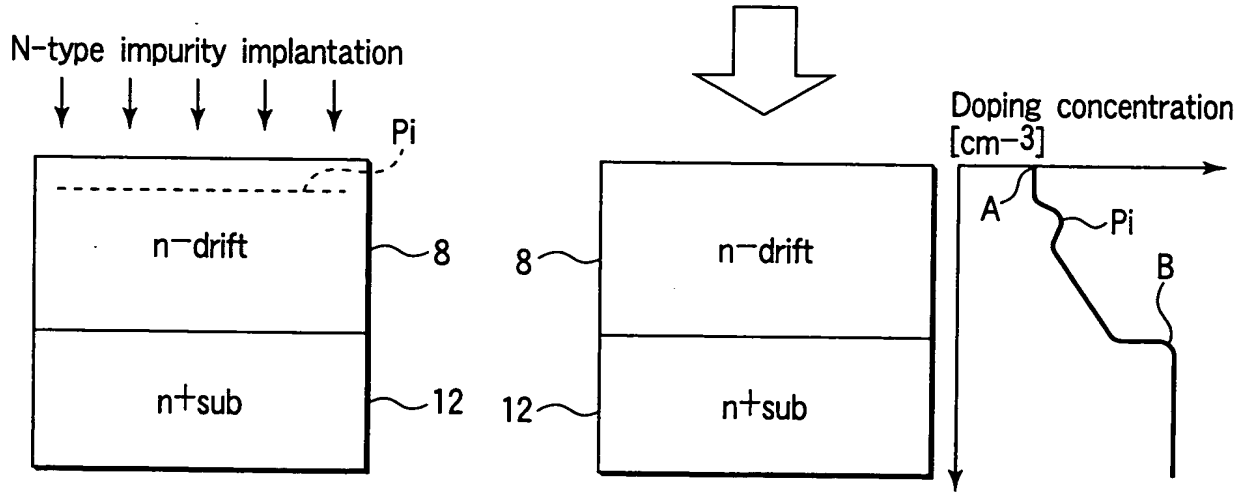


FIG. 8D

FIG. 8E

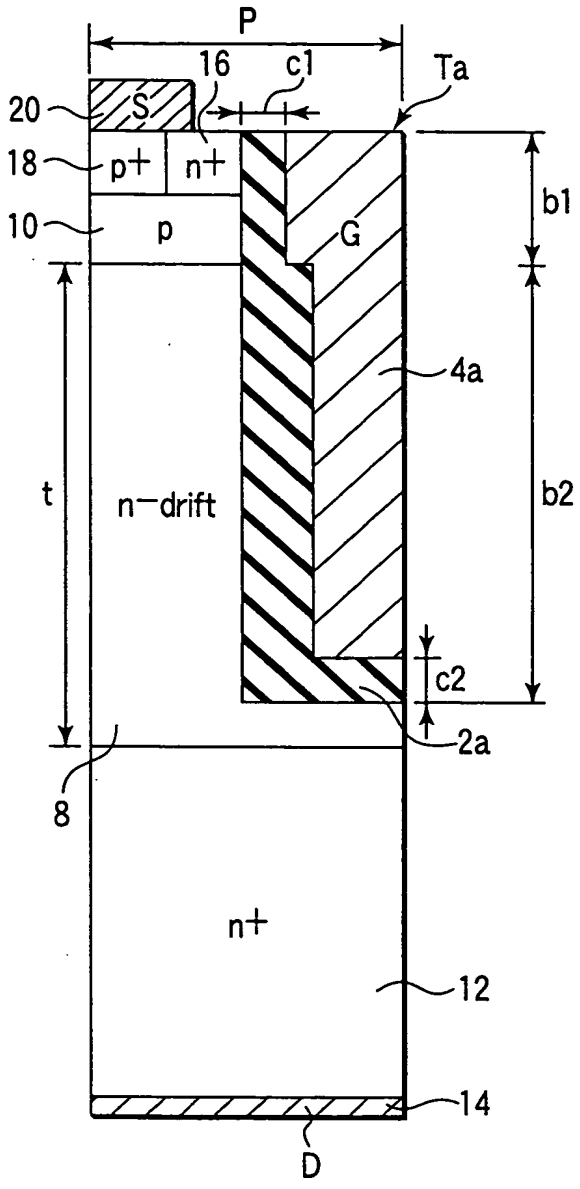

P
16
c1
Ta
20
S
18
p+
n+
10
p
G
b1
4a
t
n−drift
b2
c2
2a
8
n+
12
14
D

FIG. 9

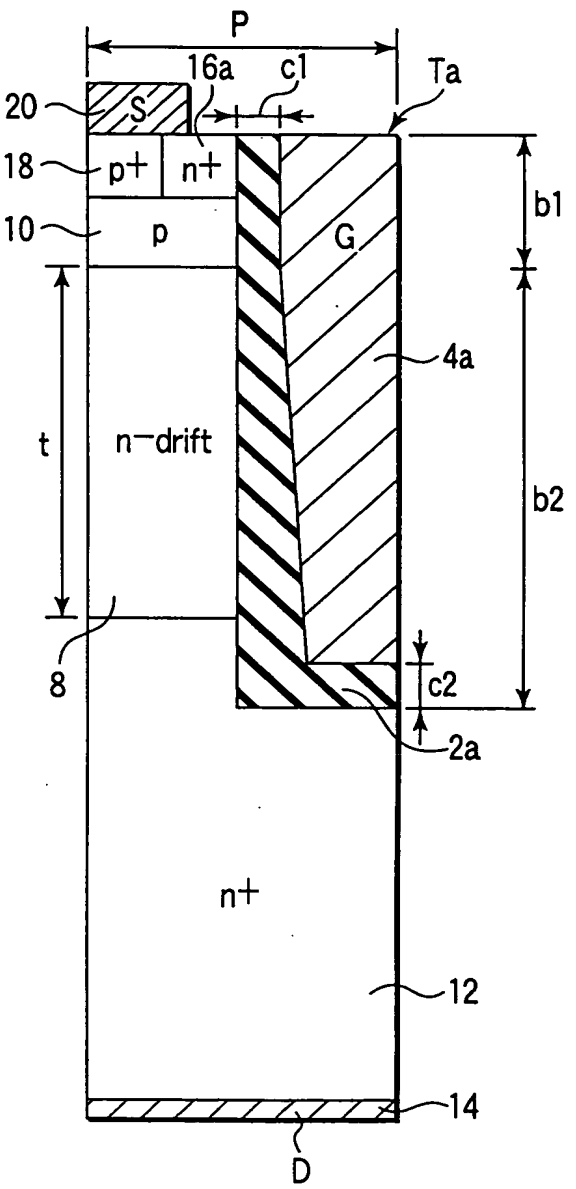

P
16a
c1
Ta
20
S
18
p+
n+
10
p
G
b1
4a
t
n−drift
b2
c2
2a
8
n+
12
14
D

FIG. 10

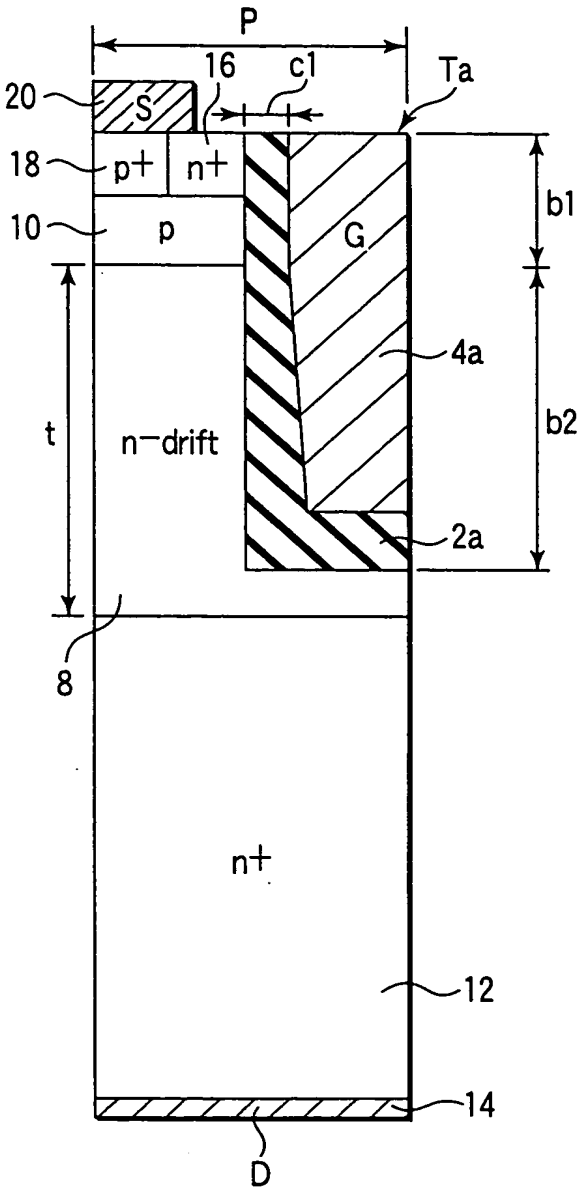

P
16
c1
Ta
20
S
18
p+
n+
10
p
G
b1
b2
4a
t
n−drift
2a
8
n+
12
14
D

FIG. 11

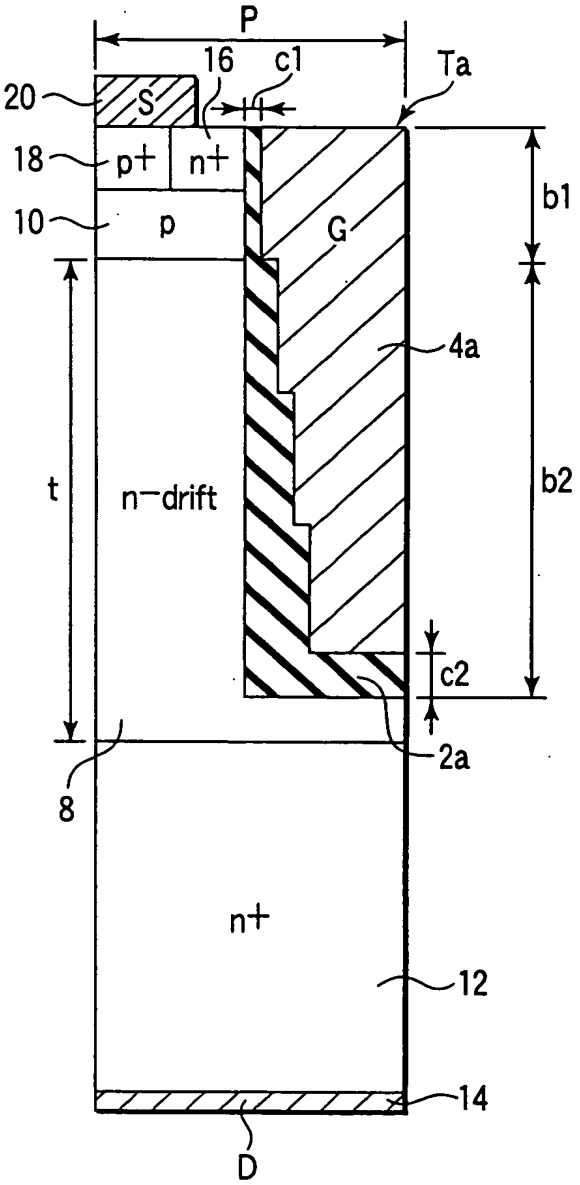

P
16
c1
Ta
20
S
18
p+
n+
10
p
G
b1
b2
4a
t
n−drift
c2
2a
8
n+
12
14
D

FIG. 12

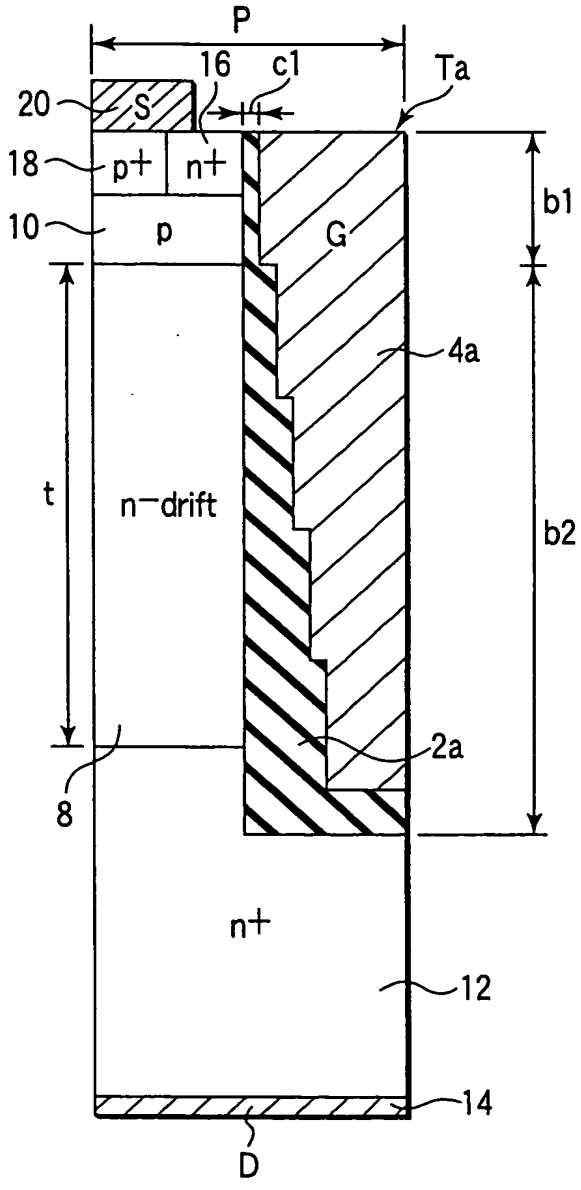

P
16
c1
Ta
20
S
18
p+
n+
10
p
G
b1
4a
t
n−drift
b2
2a
8
n+
12
14
D

FIG. 13

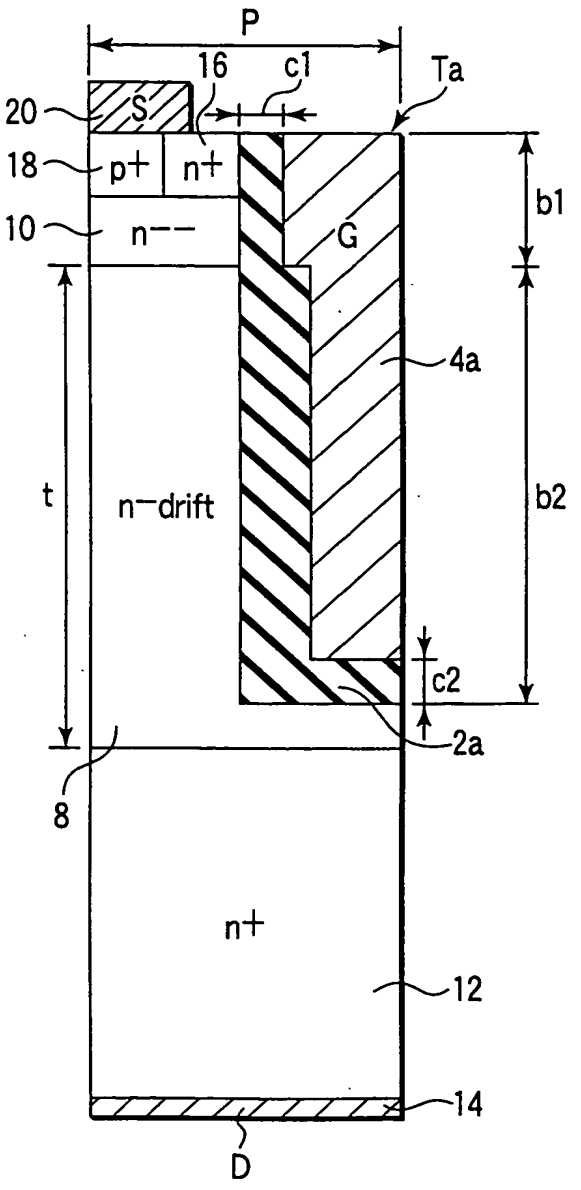

P
16
c1
Ta
20
S
18
p+
n+
10
n−−
G
b1
4a
t
n−drift
b2
c2
2a
8
n+
12
14
D

FIG. 15

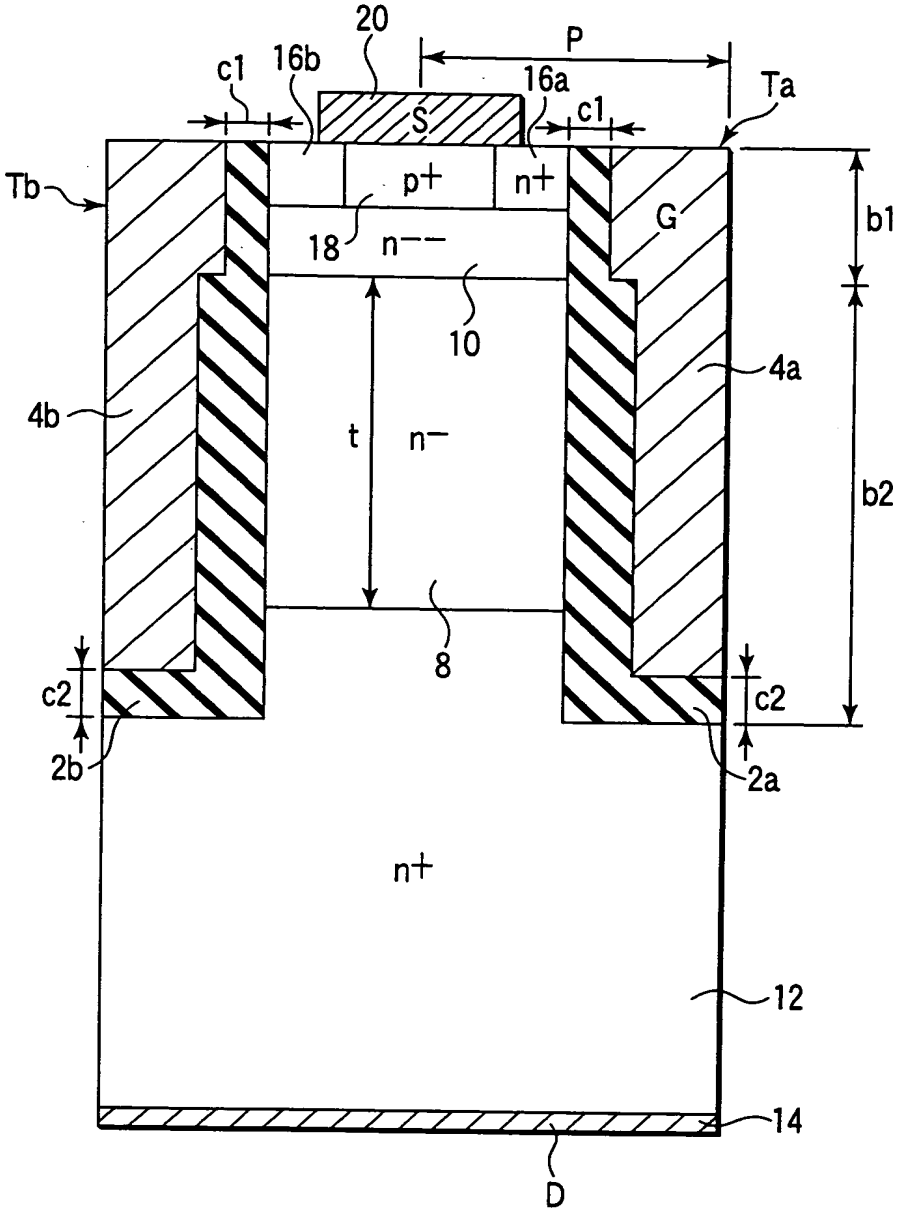

20
P
c1
16b
16a
c1
Ta
S
Tb
p+
n+
G
b1
18
n−−
10
4a
4b
t
n−
b2
8
c2
c2
2b
2a
n+
12
14
D

FIG. 14

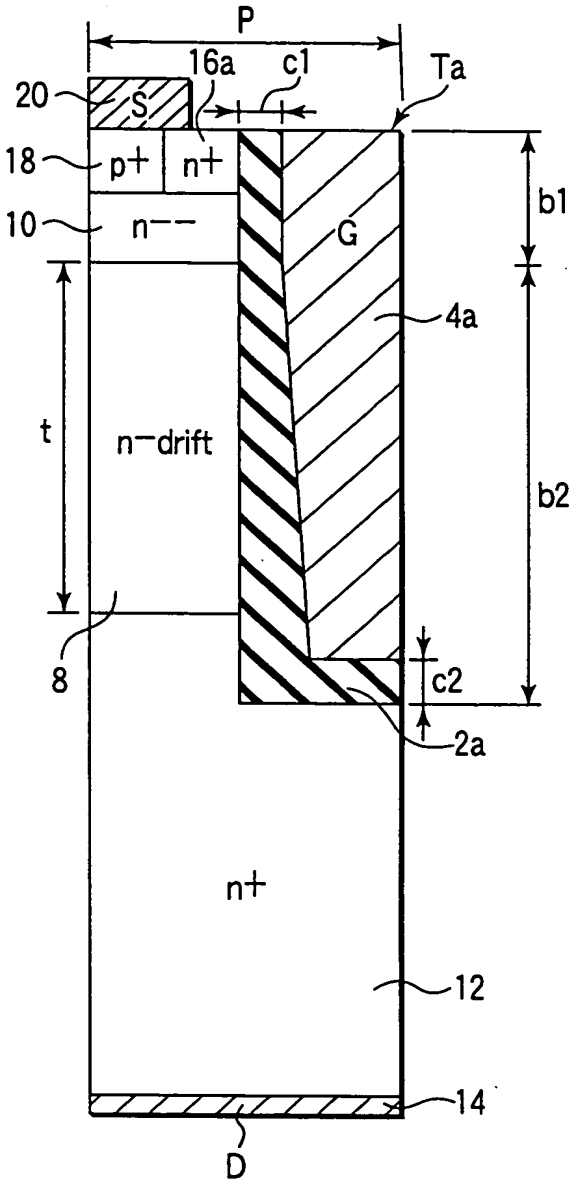

P
16a
c1
Ta
20
S
18
p+
n+
10
n−−
G
b1
4a
t
n−drift
b2
8
c2
2a
n+
12
14
D

FIG. 16

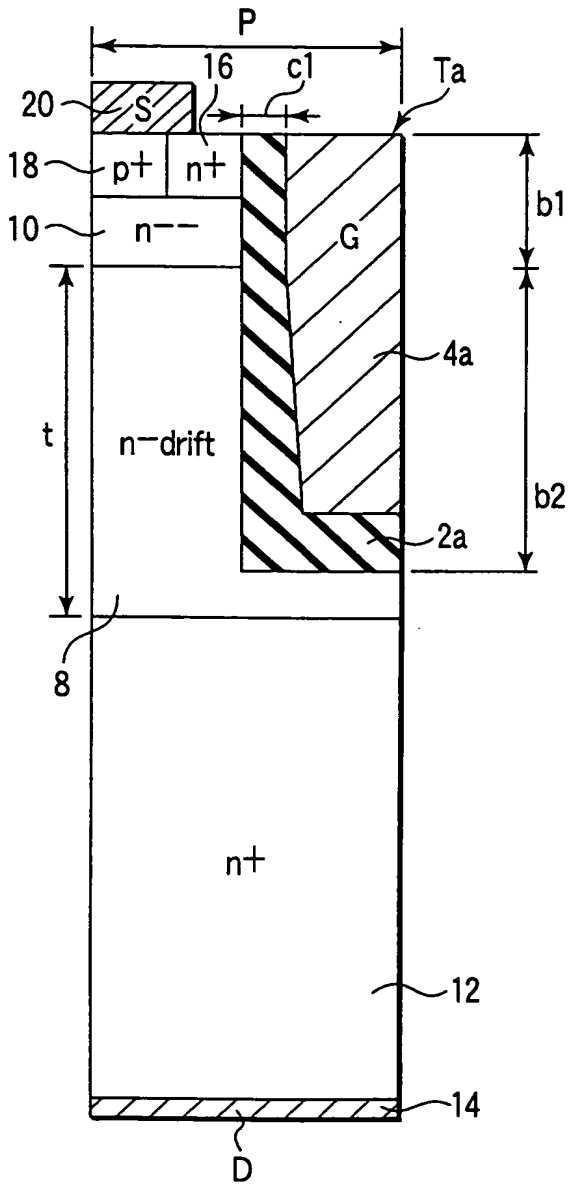

P
16
c1
Ta
20
S
18
p+
n+
10
n−−
G
b1
4a
t
n−drift
b2
2a
8
n+
12
14
D

FIG. 17

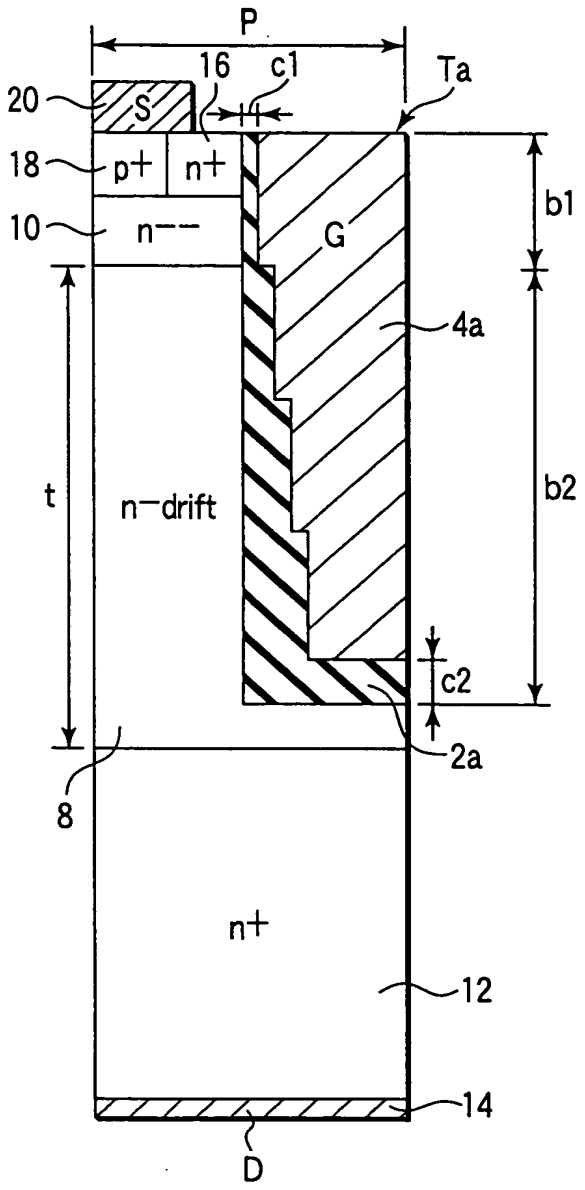

P
16
c1
Ta
20
S
18
p+
n+
10
n−−
G
b1
4a
t
n−drift
b2
c2
2a
8
n+
12
14
D

FIG. 18

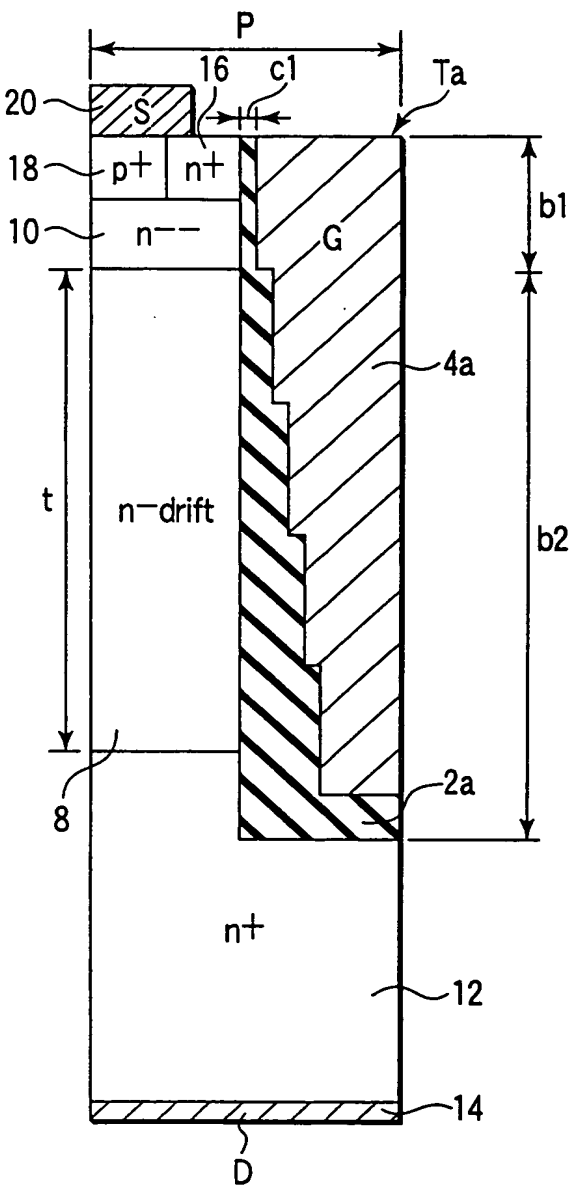

P
16
c1
Ta
20
S
18
p+
n+
10
n−−
G
b1
4a
t
n−drift
b2
2a
8
n+
12
14
D

FIG. 19

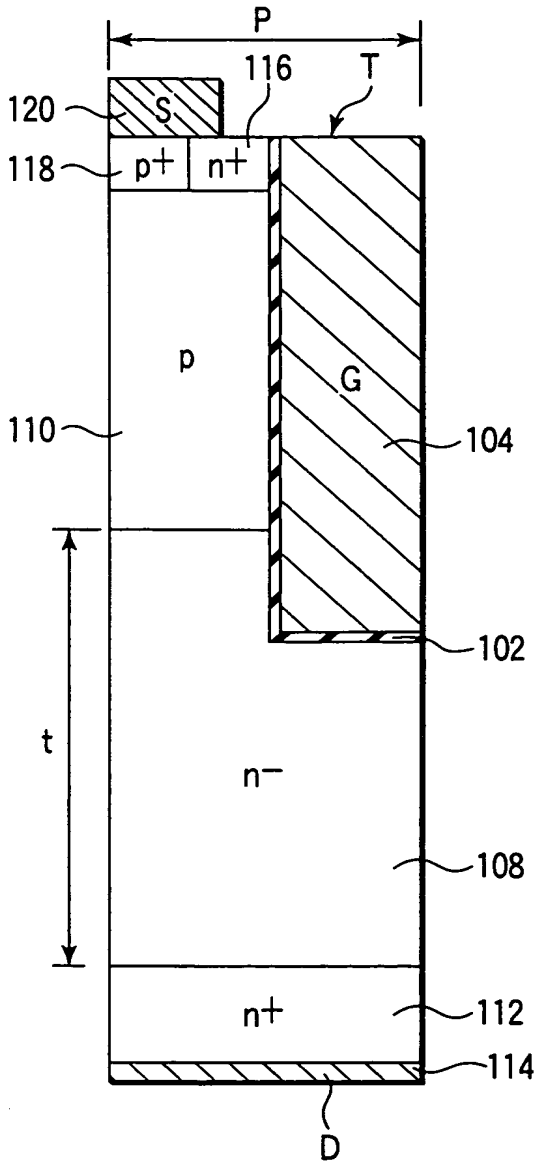

P
116
T
120
S
118
p+
n+
p
G
110
104
102
t
n−
108
n+
112
114
D

FIG. 20

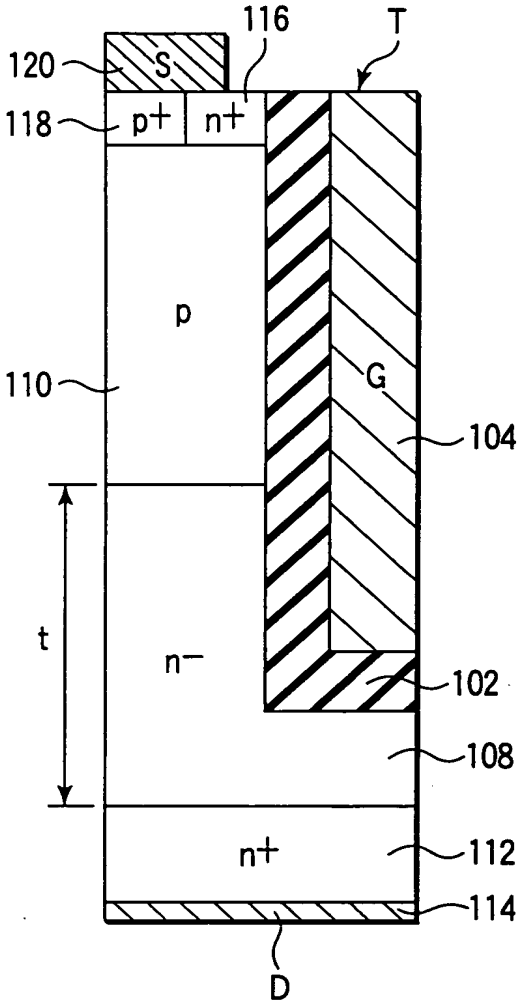

116
T
120
S
118
p+
n+
p
G
110
104
t
n−
102
108
n+
112
114
D

FIG. 21